

Detailed Action

1. This Office Action is submitted in response to the RCE/amendment filed 12-26-2007, wherein claims 1, 2, 10, and 11 are amended. Claims 1-11 are pending.

Claims Rejection – 35 U.S.C. 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Amended claims 1, 2, 10, and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The particular limitation “acquiring means for acquiring a first distance between a top of the peak and a foot portion of the peak of one side in the peak of the derivative waveform, and a second distance between a top of the peak and a foot portion of the peak of the other side in the peak of the derivative waveform;” renders claims 1, 2, 10, and 11 indefinite, because the limitation as claimed, would indicate to a person having ordinary skill in the art of CD-SEM profiling that, the first and second distances are measured on either side of the same peak of the derivative waveform, whereas paragraph [0039] of the instant application defines two distances at two different peak positions; a space-side peak position 403S, and a line-side peak position 403L of the derivative waveform shown in applicants Figure 4. As a result, it is the examiners contention that the above limitation is indefinite regarding the claimed first and second distances, and thus fails to distinctly claim the subject matter which applicant regards as the invention.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Amended claims 1, 2, 10, and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contain subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Particular subject matter contained in amended claims 1, 2, 10, and 11 includes the limitation "judging means for judging the longer distance side in the both side as the line pattern or the shorter distance side in the both side as the space between the line patterns, based on the comparing the first distance with the second distance."

A review of the specification and drawings has indicated a complete absence of any description relating to "a both side". As a result it is the examiners contention that the specification does not contain clear, concise, and exact terms that would enable any person skilled in the art to make and use the now claimed invention.

Claims Rejection – 35 U.S.C. 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,627,887 to Dudley.

8. Regarding claim 11, Dudley discloses at Col. 2, line 48-66, a CD scanning electron microscope including the following;

- (a) a beam scanned over a structure 126 (deflector). See Col. 2, line 64-66;
- (b) a detector 119. See Col. 2, line 53-56.
- (c) a control module 123 (processor). Col. 2, line 56-62;
- (d) generating a dimensional waveform of structure 126 (a profile waveform). Col. 3, line 1-7;

(e) forming a derivative waveform of the dimensional waveform with control system 123a. Col. 3, line 8-30; and Col. 5, line 5-20;

(f) using profiling logic 336 to determine first distances LEW1-LEW5 (Figure 3A below) between the peak and foot of the outer edge of the left peak 146 (one side in the peak); as well as, second distances REW1-REW5 between the peak and foot of the outer edge of the right peak 149 (the other side in the peak of the derivative waveform) Col. 5, line 46-64.

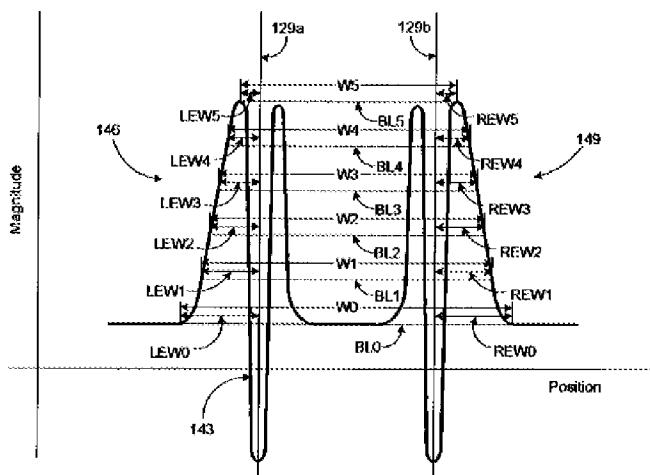
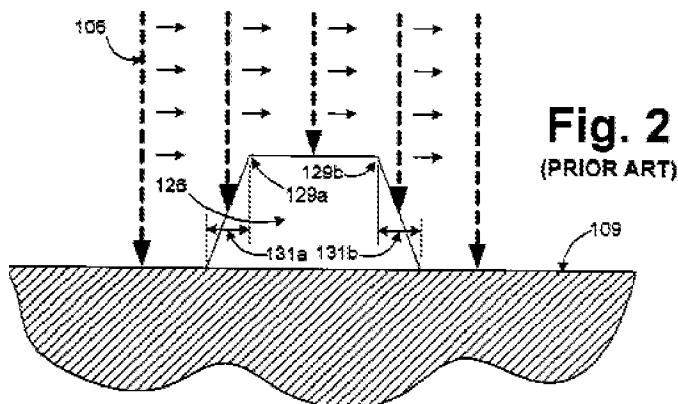


Fig. 3A

Dudley fails to teach comparing the first distance with the second distance and determining that the longer of the first and second distances is the line pattern, and the shorter of the first and second distances is the space between the line patterns.

However, Dudley discloses constructing a derivative waveform (Figure 3A above) from SEM beam scan of the structure 126 (see Figure 2 below),



and using profiling logic 336 to construct the profile 153 of structure 126 (shown in Figure 3B below).

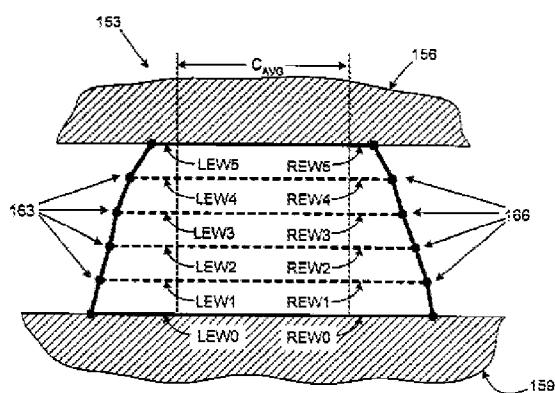


Fig. 3B

In addition, the profiling logic 336 performs a comparison between the profile 153 and a target profile to determine whether the structure 126 meets acceptable standards. See also Col. 5, line 46-53.

The examiner has interpreted from the above that the shape defined by the distances in Figure 3B, is a line on the surface of wafer 109, and that the foot portions define the space on either side of line 126.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to scan the surface of a wafer with an SEM and use the distances defined by the derivative waveform of the scan in accordance with Dudley to provide a profile from which one skilled in the art can judge whether the SEM scan of a structure on a wafer is a line or a space.

9. Regarding claims 1-10, Dudley discloses the apparatus used in these method claims, as described above regarding claim 11.

Conclusion

10. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim can be reached at (571) 272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

April 7, 2008

/ROBERT KIM/

Supervisory Patent Examiner, Art Unit 2881

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